

**REMARKS**

The Office Action of January 23, 2003, presents the examination of claims 11-23 and 26-29. Claims 24 and 25 are withdrawn from consideration. Claims 11, 12, 14, 15, 16, and 18 are amended. No new matter is inserted into the application.

***Claim Objections***

The Examiner objects to claim 12 for a typographical error. Claim 12 is amended as suggested by the Examiner. Thus, the instant rejection is overcome.

***Restriction Requirement***

The Examiner asserts that the subject matter of claims 24 and 25 are not linked to the subject matter of claims 11-23 and 26-29 via a special technical feature under PCT Rule 13.1. As such, the Examiner withdraws claims 24 and 25 from consideration as being drawn to a non-elected invention. Applicants respectfully traverse. Reconsideration of the claims and withdrawal of the instant restriction requirement are respectfully requested.

Specifically, the Examiner asserts, "Newly submitted claims 24-25 are drawn to a second method of use of already generated mutant barnase genes, namely bacterial transformation, which requires different starting materials, transformation and culture steps, and gene regulatory sequences, each not required by the

previously examined invention." Applicants respectfully submit that the Examiner misunderstands the method of claims 24 and 25. In actuality, claim 24 is directed to "A method to obtain a mutant barnase gene as claimed in any one of claims 19 to 21...." Claim 25 is dependent upon claim 24. Thus, claims 24 and 25 are not drawn to a second method of use as asserted by the Examiner.

As such, claims 24 and 25 are indeed linked via a special technical feature to claims 11-23 and 26-29 under PCT Rule 13.1. Rejoinder and examination of all claims in the present application are therefore respectfully requested.

***Rejection under 35 U.S.C. § 112, first paragraph***

The Examiner rejects claims 13-14, 17-23, and 26-29 for an alleged lack of written description. The Examiner also rejects claims 13-14, 17-23, and 26-29 for an alleged lack of enablement. Applicants respectfully traverse. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

Specifically, the Examiner alleges that "the specification, while being enabling for claims limited to a mutant barnase gene which encodes SEQ ID NO: 2 and which contains an insertion of a T nucleotide at position 15, does not reasonably provide enablement for any mutant barnase gene which contains a multitude of non-exemplified deletions, additions or substitutions yet retains the

ability to encode a functional barnase protein, optionally due to frameshift recoding." Applicants respectfully disagree.

As noted in the Reply filed on November 13, 2002, the expression level of barnase activity can be decreased due to the frameshift re-coding. Thus, an idea of the present invention is that barnase can be attenuated substantially by using the phenomenon of frameshift re-coding, which provides for the method of making male sterile plants as claimed in claims 27-29. Therefore, it will be apparent for those skilled in the art that any DNA that encodes a mutant barnase gene having a mutation relating to the frameshift re-coding and its derivatives can be used in the method of claims 27-29.

Furthermore, in claims 13-14, 17-23 and 26-29, the number of substitution, deletion, insertion or addition of the nucleotides is limited to "one to several." It would be routine experimentation for those skilled in the art to practice the invention within the claimed scope.

Applicants respectfully submit that the pending claims fully comply with 35 U.S.C. § 112, first paragraph. Withdrawal of the rejection is therefore respectfully requested.

***Rejection under 35 U.S.C. § 112, second paragraph***

The Examiner rejects claims 11 and 13-18 under 35 U.S.C. § 112, second paragraph for allegedly being indefinite. Applicants respectfully traverse. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

*Claims 11, 15, and 16*

The Examiner asserts that the recitation of "initiation codon" is unclear. Applicants amend the claims to recite translation initiation codon" as suggested by the Examiner. Thus, the instant rejection is overcome.

*Claims 14 and 18*

The Examiner asserts that the recitation of "1- to 27-positions" in claims 14 and 18 is unclear as to (1) whether nucleotides or amino acids are referred to, and (2) the reference point used to calculate the position numbering. First, Applicants clarify that the positions refer to nucleotides. Second, the 1<sup>st</sup> nucleotide refers to "A" (adenine) of the first "ATG" (methionine) codon. Second, claims 14 and 18 are amended to recite "the 1<sup>st</sup> to 27<sup>th</sup> nucleotides...." Regarding claim 14, it is clear that the first 27 nucleotides of the mutant barnase gene of claim 13 are identical to the first 27 nucleotides of the mutant barnase gene of claim 12. Similarly, in claim 18 it is clear that the first 27 nucleotides of

the mutant barnase gene of claim 17 are identical to the first 27 nucleotides of the mutant barnase gene of claim 16. Thus, the instant rejection is overcome.

Applicants respectfully submit that the pending claims fully comply with 35 U.S.C. § 112, second paragraph. Withdrawal of the rejection is therefore respectfully requested.

***Rejection under 35 U.S.C. § 102(b)***

WO '283

Claims 13, 17, 21-23, and 26-29 are rejected under 35 U.S.C. § 102(b) for allegedly being anticipated by WO '283 (WO 96/26283). Applicants respectfully traverse. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

WO '283 is directed to the barnase gene *per se*. Claim 13 is directed to a mutant barnase gene comprising a nucleotide sequence modified from that of the mutant barnase gene as set forth SEQ ID NO:2 by substitution, deletion, insertion or addition of one to several nucleotides, provided that the inserted T nucleotide and the deleted A nucleotide are not modified. Thus, regardless of the substitution, deletion, insertion or addition of one to several nucleotides, the mutant barnase gene of claim 13 must possess an inserted T nucleotide at position 15 and a deleted A nucleotide at position 333. WO '283 fails to disclose a mutant barnase gene

possessing an inserted T nucleotide at position 15 and a deleted A nucleotide at position 333.

Since WO '283 fails to describe each and every element of the claimed invention, WO '283 fails to anticipate the claims. Withdrawal of the instant rejection is therefore respectfully requested.

Serrano et al.

Claims 13, 17, and 21-22 are rejected under 35 U.S.C. § 102(b) for allegedly being anticipated by Serrano et al. Applicants respectfully traverse. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

Serrano et al. discloses a modified barnase gene. Claim 13 is directed to a mutant barnase gene comprising a nucleotide sequence modified from that of the mutant barnase gene as set forth SEQ ID NO:2 by substitution, deletion, insertion or addition of one to several nucleotides, provided that the inserted T nucleotide and the deleted A nucleotide are not modified. Thus, regardless of the substitution, deletion, insertion or addition of one to several nucleotides, the mutant barnase gene of claim 13 must possess an inserted T nucleotide at position 15 and a deleted A nucleotide at position 333. Serrano et al. fails to disclose a mutant barnase

gene possessing an inserted T nucleotide at position 15 and a deleted A nucleotide at position 333.

Since Serrano et al. fails to describe each and every element of the claimed invention, Serrano et al. fails to anticipate the claims. Withdrawal of the instant rejection is therefore respectfully requested.

Jucovic et al.

Claims 13, 17, and 21-22 are rejected under 35 U.S.C. § 102(b) for allegedly being anticipated by Jucovic et al. Applicants respectfully traverse. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

Jucovic et al. discloses a modified barnase gene. Claim 13 is directed to a mutant barnase gene comprising a nucleotide sequence modified from that of the mutant barnase gene as set forth SEQ ID NO:2 by substitution, deletion, insertion or addition of one to several nucleotides, provided that the inserted T nucleotide and the deleted A nucleotide are not modified. Thus, regardless of the substitution, deletion, insertion or addition of one to several nucleotides, the mutant barnase gene of claim 13 must possess an inserted T nucleotide at position 15 and a deleted A nucleotide at position 333. Jucovic et al. fails to disclose a mutant barnase

gene possessing an inserted T nucleotide at position 15 and a deleted A nucleotide at position 333.

Since Jucovic et al. fails to describe each and every element of the claimed invention, Jucovic et al. fails to anticipate the claims. Withdrawal of the instant rejection is therefore respectfully requested.

***Rejection under 35 U.S.C. § 103(a)***

Claims 13, 17, 21-23, and 26-29 are rejected under 35 U.S.C. § 103(a) for allegedly being obvious over WO '283 combined with Serrano et al. and Jucovic et al. Applicants respectfully traverse. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

Applicants respectfully submit that the combination of references does not make the present invention obvious. The cited references merely disclose barnase gene *per se* or a mutated barnase gene wherein the activity of barnase itself is decreased. In contrast, the present invention is based on the idea of decreasing the expression level of barnase by using the frameshift re-coding, thus attenuating the barnase activity in plant tissues. Specifically, the insertion of a T nucleotide in the mutant barnase of the present invention gives rise to a frameshift re-coding which decreases the activity of barnase.



In addition, a method to produce male sterile transgenic plants by using the attenuation by way of frameshift re-coding is not described or even remotely suggested in any of the cited references. Therefore, none of the cited references, either alone or in combination, makes the present invention obvious. Withdrawal of the instant rejection is therefore respectfully requested.

***Summary***

Applicants respectfully submit that the rejections of record have been overcome and the instant claims recite patentable subject matter such that the present application should be placed into condition for allowance. Early and favorable action on the merits is therefore respectfully requested.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicant(s) respectfully petition(s) for a three (3) month extension of time for filing a reply in connection with the present application, and the required fee of \$930.00 is attached hereto.


Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Kristi L. Rupert, Ph.D. (Reg. No. 45,702) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Appl. No. 09/509,945

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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